

REMARKS

Applicants have considered the official action mailed February 21, 2006. It is respectfully submitted that the claims are directed to patentable subject matter as set forth below.

The rejections are as follows:

- (1) Claim 22 under 35 U.S.C. §102(b) over U.S. Patent No. 5,833,516 (De Haas) or U.S. Patent No. 4,339,322 (Balko) or U.S. Patent No. 4,301,222 (Emanuelson);
- (2) Claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. §103(a) over Balko in view of De Haas or, alternatively, over De Haas in view of Balko;
- (3) Claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. §103(a) over Emanuelson in view of De Haas or, alternatively, over De Haas in view of Emanuelson;
- (4) Claim 12 under 35 U.S.C. §103(a) over De Haas in view of Balko or, alternatively, Balko in view of De Haas as previously applied, or Emanuelson in view of De Haas or, alternatively, De Haas in view of Emanuelson as previously applied, and further in view of U.S. Patent No. 5,738,574 (Tolles); and

- (5) Claim 16 under 35 U.S.C. §103(a) over De Haas in view of Balko or, alternatively, Balko in view of De Haas as previously applied, or Emanuelson in view of De Haas or, alternatively, over De Haas in view of Emanuelson as previously applied, and further in view of U.S. Patent No. 5,750,190 (Kondrats).

Claim 23 is the sole independent claim. Claim 23 claims a method for manufacturing flow field plates for fuel cells, electrolyzers and batteries which contain a fluid electrolyte comprising providing an electrically conductive plate material impermeable to hydrogen and oxygen; positioning a particulate etchant-resistant patterned mask comprising a pattern design adjacent the plate material; sandblasting, bead blasting or grit blasting the particulate etchant-resistant patterned mask to etch on the plate material a fluid flow pattern determined by the pattern design on the mask; and providing at least two of said flow field plates in a fuel cell, electrolyser or battery containing a fluid electrolyte, the fluid flow pattern being structured to distribute fuel and oxidant across the plate material.

Claim 23 has been amended to clarify that certain features, which the Examiner asserts are merely directed to

intended use and thus are not provided patentable weight, are specifically claimed and do provide patentably distinct features to the claimed matter. Most notably, it is clarified that the plate material provided in the method is structured to distribute fuel and oxidant and that the flow field plates are provided in a fuel cell, electrolyser or battery containing a fluid electrolyte. Support is present at page 1, third paragraph, and page 3, fourth full paragraph. Thus, the flow field plate of claim 22 formed by the claimed method also has these structural features. Accordingly, these claimed features in combination with the remaining claimed features must be taught or suggested by the applied art in order for the applied art to anticipate or render obvious the claims within the meaning of 35 U.S.C. §102 or §103 respectfully. As to inherency as relied on by the Examiner for teaching certain claimed features, e.g. impermeability of an electrically conductive plate to hydrogen and oxygen gases, in finding obviousness of a claimed invention over a combination of references, or over a single reference, a reason must appear in the prior art for making the combination or for selecting the different features of a single reference. The court in In re Newell, 13 USPQ2d 1248 (Fed Cir. 1989), at page 1250, stated —

"It is well established that in deciding that a novel combination would have been obvious, there must be supporting teaching in the prior art.

'That which may be inherent is not necessarily known. Obviousness cannot be predicated on what is unknown.' In re Spormann, 363 F.2d 444, 448, 150 USPQ 449, 452 (CCPA 1966)."

Further, in determining obviousness, based on a combination of references, teachings of each reference as a whole must be considered and are significant since in view of a deficiency in teaching as to one or more claimed features or lack of teaching suggesting combining different features taught by different references, the references upon combination will not render obvious the claims within the meaning of 35 U.S.C. §103.

Claim 22 claims a flow field plate formed by the method of claim 23. The Examiner has rejected claim 22 under 35 U.S.C. §102(b) over De Haas or Balko or Emanuelson.

De Haas is directed to plates of electrically insulating material having a plurality of cavities and/or apertures arranged in a pattern. De Haas does not teach an electrically conductive plate material in a flow field plate.

Additionally, De Haas teaches insulating plates used as control plates, spacer plates, or electron transport duct plates. The flow field plates manufactured as claimed are structured to distribute fuel and oxidant not electrons across the plate material.

Additionally, De Haas does not teach or suggest a plate material impermeable to hydrogen and oxygen as claimed.

Accordingly, De Haas does not teach or suggest each and every element of the claimed flow field plate and does not anticipate claim 22 within the meaning of 35 U.S.C. §102. Withdrawal of the §102 rejection based on De Haas is, thus, respectfully requested.

Balko describes pressure molded plates. Balko does not teach a plate material with a fluid flow pattern as claimed etched thereon. Also, Balko does not teach or suggest a fluid flow pattern in a plate material which is structured to distribute fuel and oxidant across the plate material in a fuel cell, electrolyser or battery containing a fluid electrolyte. Additionally, Balko does not teach or suggest a plate material impermeable to hydrogen and oxygen in a flow field plate.

Thus, Balko does not teach or suggest each and every element of the claimed flow field plate and does not

anticipate claim 22 within the meaning of 35 U.S.C. §102. Withdrawal of the §102 rejection based on Balko is respectfully requested.

Emanuelson describes a thin electrochemical cell separator plate resultant from molding and graphitizing a mixture of high purity graphite powder and carbonizable thermosetting phenolic resin. Emanuelson does not teach a sandblasted, bead blasted or grit blasted particulate etchant-resistant patterned mask etched fluid flow pattern in a plate material.

Additionally, Emanuelson does not teach or suggest a plate material impermeable to hydrogen and oxygen of a flow field plate. Also, Emanuelson does not teach or suggest an electrically conductive plate material of a flow field plate. Rather, Emanuelson teaches plates having electrical thru-plane resistivity.

Accordingly, Emanuelson does not teach or suggest each and every element of the claimed flow field plate and does not anticipate claim 22 within the meaning of 35 U.S.C. §102. Withdrawal of the §102 rejection based on Emanuelson is, thus, respectfully requested.

Balko is also applied in view of De Haas or, alternatively De Haas is applied in view of Balko to reject claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. §103(a).

De Haas does not make up for the shortcomings of Balko set forth above. Similarly, Balko does not make up for the shortcomings of De Haas set forth above. Neither of De Haas nor Balko teach or suggest a method of manufacturing flow field plates according to the claimed combination of method steps. For example, neither De Haas nor Balko teach or suggest the making of flow field plates etched to provide a fluid flow pattern in the plate material which is structured to distribute fuel and oxidant across the plate material as claimed. Neither Balko nor De Haas suggests any motivation to modify the teachings of Balko or De Haas in order to provide the claimed method. Accordingly, Balko in combination with De Haas or, alternatively De Haas in combination with Balko do not render the claimed method obvious within the meaning of 35 U.S.C. §103(a). Withdrawal of the §103 rejections are respectfully requested.

Emanuelson is applied in view of De Haas or, alternatively De Haas is applied in view of Emanuelson to reject claims 3-5, 10-11, 13-15 and 17-23 under 35 U.S.C. §103(a). De Haas does not make up for the shortcomings of Emanuelson set forth above. Similarly, Emanuelson does not make up for the shortcomings of De Haas set forth above. Neither De Haas nor Emanuelson teach or suggest providing an electrically conductive plate material in a method of

manufacturing flow field plates as claimed. Rather, De Haas discloses plates made of electrically insulating material while Emanuelson discloses plates having electrical thru-plane resistivity and in-plane resistivity. Further, neither De Haas nor Emanuelson teach or suggest providing an electrically conductive plate material which is impermeable to hydrogen and oxygen as claimed.

Neither De Haas nor Emanuelson suggest any motivation to modify the teachings of Emanuelson or De Haas in order to provide the claimed method. Accordingly, Emanuelson in combination with De Haas or, alternatively De Haas in combination with Emanuelson do not render the claimed method obvious within the meaning of 35 U.S.C. §103(a). Withdrawal of the §103 rejections are respectfully requested.

De Haas is applied in view of Balko or, alternatively Balko is applied in view of De Haas as previously applied, or Emanuelson is applied in view of De Haas or, alternatively De Haas is applied in view of Emanuelson as previously applied, and further in view of Tolles in order to reject dependent claim 12 under 35 U.S.C. §103(a). Neither the combination of Balko and De Haas nor the combination of Emanuelson and De Haas teach or suggest the claimed method as set forth above. Further, Tolles does

not make up for the shortcomings of Balko and De Haas or Emanuelson and De Haas set forth above.

More specifically, Tolles describes a mechanical polishing system with no disclosure of applicability to flow field plates or providing for the manufacture of flow field plates. Accordingly, Tolles does not teach or suggest providing an electrically conductive plate material impermeable to hydrogen and oxygen in a method as claimed. Additionally, Tolles does not teach or suggest blasting methods for etching a pattern on a plate material, in particular where the pattern provided is a fluid flow pattern structured to distribute fuel and oxidant across a plate material as claimed.

Neither De Haas nor Balko suggest any motivation to modify the teachings of Balko, De Haas or Tolles in order to provide the claimed method. Similarly, neither Emanuelson nor De Haas suggest any motivation to modify the teachings of De Haas, Emanuelson or Tolles in order to provide the claimed method. Accordingly, neither the combination of De Haas, Balko and Tolles nor the combination of De Haas, Emanuelson and Tolles renders the claimed method obvious within the meaning of 35 U.S.C. §103(a). Withdrawal of the § 103 rejections are respectfully requested.

De Haas is applied in view of Balko or, alternatively Balko is applied in view of De Haas as previously applied, or Emanuelson is applied in view of De Haas or, alternatively De Haas is applied in view of Emanuelson as previously applied, and further in view of Kondrats to reject dependent claim 16 under 35 U.S.C. §103(a). Neither the combination of De Haas and Balko nor the combination of Emanuelson and De Haas teach or suggest the claimed method as set forth above. Kondrats does not make up for the shortcomings of the combination of De Haas and Balko or Emanuelson and De Haas set forth above.

More specifically, Kondrats describes vinyl polymer masks used as protective coatings during mechanical processing operations of vehicles or buildings. Kondrats does not teach or suggest providing an electrically conductive plate material impermeable to hydrogen and oxygen in a method for manufacturing flow field plates as claimed. Additionally, Kondrats does not teach or suggest blasting methods as claimed to etch in a plate material a fluid flow pattern structured to distribute fuel and oxidant across a plate material as claimed.

Neither De Haas nor Balko suggest any motivation to modify the teachings of De Haas, Balko or Kondrats in order to provide the claimed method. Neither De Haas nor

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Emanuelson suggest any motivation to modify the teachings of De Haas, Emanuelson or Kondrats in order to provide the claimed method. Accordingly, neither the combination of De Haas, Balko and Kondrats nor the combination of De Haas, Emanuelson and Kondrats renders the claimed method obvious within the meaning of 35 U.S.C. §103(a). Withdrawal of the §103 rejections are respectfully requested.

Therefore, withdrawal of the §102 rejections and the §103 rejections based on the applied references is respectfully requested.

Reconsideration and allowance of the claims is respectfully urged.

Respectfully submitted,

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